

APJ Abdul Kalam Technological University
Ernakulam II Cluster
Second Semester M.Tech Degree Examination May 2017

Time: 3 hrs.

05EC 6002 MIXED SIGNAL VLSI DESIGN Max. Marks: 60

- 1) (a) Draw the circuit diagram and obtain the transfer function $H(z)$ of a parasitic sensitive SC Integrator. (4 Marks)
- (b) Draw the circuit diagram of a Tow-Thomas Biquad filter and obtain the transfer function of LPF from it. Modify the circuit to obtain the Notch response. Write the expression for its output voltage and draw different Notch responses. (8 Marks)
- 2) (a) What are the advantages of $G_m - C$ filters? Analyze single ended 1st order $G_m - C$ filters and derive its design equations. (8 Marks)
- (b) What is the requirement of tuning in integrated continuous time filters? Explain tuning in $G_m - C$ filters. (4 Marks)
- 3) (a) Draw the circuit diagram of a 3 – bit resistor string DAC and explain. (4 Marks)
- (b) Discuss with the accuracy issues related to pipeline ADC. (6 Marks)
- (c) Discuss about the mismatch errors related to Current steering DACs. (8 Marks)

OR

- 4) (a) Draw and explain a 3-bit flash ADC. (4 Marks)
- (b) Calculate the INL and DNL of the resistor string DAC (6 Marks)
- (c) Draw the block diagram of successive approximation ADC and write the successive approximation algorithm to explain the conversion method. (8 Marks)
- 5) With suitable diagrams, explain the system architecture of sigma delta DAC & ADC's. (18 Marks)

OR

- 6) (a) Explain the concept of oversampling without noise shaping. (6 Marks)
- (b) Analyze the SNR_{max} in $\Sigma\Delta$ modulator with First -order and second order noise shaping. (12 Marks)